CLAIMS:

1. A method for the temporal synchronization of clocks (15) which are assigned to nodes (10) that communicate via a communication medium (5), characterized by the following steps:

- at least for the nodes (10) that are to be synchronized: acquiring (110) state values which are dependent on a time base of the nodes (10);

- for all acquired state values: filing (120) the acquired state value at a corresponding position in a first list (L) comprising (k+1) positions, if the acquired state value is smaller than the (k+1) smallest element or is smaller than or equal to the (k+1) smallest element of the list (L) and where k is a predefinable error tolerance;

- for all acquired state values: filing (130) the acquired state value at a corresponding position in a second list (H) comprising (k+1) positions, if the acquired state value is greater than the (k+1) greatest element or is greater than or equal to the (k+1) greatest element of the list (H);

- forming (160) a mean value (M) from the (k+1) smallest element of the first list (L) and the (k+1) greatest element of the second list (H), if $n \geq (2k+2)$, where n is the number of acquired state values;

- determining (170) a correction value (K) as a function of the mean value (M); and

- correcting (180) the clocks (15) that are to be synchronized such that a current state value of this clock (15) takes the correction value into account.

2. A method as claimed in claim 1, characterized in that the filing (120, 130) of the determined state values in the first list (L) and/or in the second list (H) is carried out sequentially.

3. A method as claimed in claim 1 or 2, characterized in that the first list (L) is formed by corresponding registers (L0, L1, ..., Lk) and/or the second list (H) is formed by corresponding registers (H0, H1, ..., Hk).

4. A method as claimed in any of the preceding claims, characterized in that

- the first list (L) is initialized with values which are greater than the greatest state value that is to be expected; and/or

- the second list (H) is initialized with values which are smaller than the smallest state value that is to be expected.

5. A method as claimed in any of the preceding claims, characterized in that

- during filing (120) of an acquired state value in the first list (L) a sorting in terms of the size of the stored state values is retained so that value(L0) ≥ value(L1) ≥ ... ≥ value(Lk) is always true, where L0, L1, ..., Lk denote the (k+1) positions of the list (L) and value(Li) is the value at a position (Li); and

- during filing (130) of an acquired state value in the second list (H) a sorting in terms of the size of the stored state values is retained so that value(H0) ≤ value(H1) ≤ ... ≤ value(Hk) is always true, where H0, H1, ..., Hk denote the (k+1) positions of the list (H) and value(Hi) is the value at a position (Hi).

6. A method as claimed in any of the preceding claims, characterized in that a state value (Z) is stored at a position (Li) of the first list (L) as a function of the following steps:

- the positions (L0, L1, ..., Lk) are searched for a position (Li) of the first list (L), so that the following is true:

- value(L0) ≥ value(L1) ≥ ... ≥ value(Li) ≥ Z ≥ value(L(i+1)) ≥ ... ≥ value(Lk);

- if no such position (Li) is found, then the state value (Z) is rejected;

- if such a position (Li) is found, then for all positions $\{(Lj \mid 0 \leq j < i\}$ the value value(Lj) stored at the position (Lj) is replaced by the value value(L(j+1)) stored at the position L(j+1) and the state value (Z) is stored at the position (Li) of the list (L).

7. A method as claimed in any of the preceding claims, characterized in that a state value (Z) is stored at a position (Hi) of the second list (H) as a function of the following steps:

- the positions (H0, H1, ..., Hk) are searched for a position (Hi) of the second list (H), so that the following is true:

- value(H0) ≤ value(H1) ≤ ... ≤ value(Hi) ≤ Z ≤ value(H(i+1)) ≤ ... ≤ value(Hk);

- if no such position (Hi) is found, then the state value (Z) is rejected;

- if such a position (Hi) is found, then for all positions {(Hj | 0 ≤ j < i} the value value(Hj) stored at the position Hj is replaced by the value value(H(j+1)) stored at the position H(j+1) and the state value (Z) is stored at the position (Hi) of the list (H).

8. A method as claimed in any of the preceding claims, characterized in that the following steps are carried out:

- as a function of an error tolerance (k), a set (B) of predefinable end values ({B0, B1, ..., B(k-1)}) is predefined such that

- B0 = 0; Bi ≤ B(i+1), for all i ∈ {0, 1, ..., (k-1)}; and

- 2j < B(j), for all j ∈ {1, ..., (k)};

- if Bk > n, a value i for i ∈ {0, 1, ..., (k-1)} is selected as a function of the number n of acquired state values such that the condition Bi ≤ n < B(i+1) is true;

- if Bk ≤ n, i = k is selected; and

- the mean value (M) is formed from the values value(L(k-j)) and value(H(k-j)) stored at the positions L(k-i) and H(k-i).

9. A method as claimed in any of the preceding claims, characterized in that the following values are predefined:

- error tolerance k = 2;

- end value B1 = 3; and

- end value B2 = 8.

10. A node (10) which communicates with other nodes (10) by means of a communication medium, characterized in that the node (10)

- has a clock (15);

- has means for acquiring state values, the state values being dependent on a time base of the node (10) and/or on a time base of the other nodes;

- has a first list (L) comprising (k+1) positions and a second list (H) comprising (k+1) positions;

- has means for filing (120) an acquired state value at a corresponding position of the first list (L);

- has means for filing (130) an acquired state value at a corresponding position of the second list (H);

- has means for forming (160) a mean value (M) from an element of the first list (L) and an element of the second list (H);

- has means for forming a correction value (K); and

- has means for correcting the clock (15).

11. A node (10) as claimed in claim 10, characterized in that a method as claimed in any of claims 1 to 9 is carried out in the node (10).

12. A communication system (1) which has a number of nodes (10) that communicate via a communication medium (5), characterized in that at least one node (10)

- has a clock (15);

- has means for acquiring state values;

- has a first list (L) comprising (k+1) positions and a second list (H) comprising (k+1) positions;

- has means for filing (120) an acquired state value at a corresponding position of the first list (L);

- has means for filing (130) an acquired state value at a corresponding position of the second list (H);

- has means for forming (160) a mean value (M) from an element of the first list (L) and an element of the second list (H);

- has means for forming a correction value (K); and

- has means for correcting the clock (15).

13. A communication system (1) as claimed in claim 12, characterized in that a method as claimed in any of claims 1 to 9 is carried out in at least one node (10).

14. A computer program which can be run on a computer, in particular on a microprocessor, characterized in that the computer program is programmed to carry out a method as claimed in any of claims 1 to 9 when it is run on the computer.

15. A computer program as claimed in claim 14, characterized in that the computer program is stored in a memory element, in particular in a Random Access Memory (RAM), a Read Only Memory (ROM) or a Flash memory.